Original Paper

Usability of a Digital Platform Supporting a Telehealth Intervention for Physical and Social Deconditioning in Older Adults: Mixed Methods Study

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Abstract

Background: Physical and social deconditioning negatively affect older adults' health and functional independence. Telehealth interventions delivered through digital health platforms may help mitigate these challenges; however, suboptimal usability design can limit user engagement and sustained adoption. To address this issue, the PromoSanté digital platform was iteratively codeveloped and evaluated to support the virtual delivery of a multidisciplinary and multimodal telehealth program targeting deconditioning in older adults.

Objective: The objective of this study was to iteratively design and evaluate the usability of the PromoSanté digital platform with older adults both under controlled conditions and during the full-scale implementation of a 16-week telehealth program. The platform consists of a web-based learning management system with an age-adapted, responsive interface, supporting synchronous videoconferencing and asynchronous engagement through interactive modules, videos, and digital resources.

Methods: An iterative convergent mixed methods design was conducted across 2 sequential phases. In phase 1, preliminary usability testing was performed with 5 older adults who completed a 4-week, task-based virtual PromoSanté scenario. Usability, task performance, and user experience were assessed using the System Usability Scale, direct observation, and focus groups, with findings informing subsequent platform refinements. Phase 2 involved a 16-week real-world implementation of PromoSanté with 30 older adults who participated in synchronous and asynchronous sessions focused on physical exercise, preventive occupational therapy, and well-being. Usability was evaluated through adherence rates, a questionnaire grounded in the unified theory of acceptance and use of technology, and focus groups.

Results: Findings from phase 1 demonstrated high perceived usability, with a median System Usability Scale score of 82.5 (IQR 70-95). Direct observations of synchronous sessions and focus groups indicated strong user satisfaction and informed targeted refinements, including enlarging interactive buttons to improve touch-screen usability. Additional equipment was provided to enhance accessibility, such as tripods and styluses for older adults and wireless headsets for health care professionals. Phase 2 confirmed high adherence rates to synchronous (85.4%) and asynchronous (83.3%) sessions, alongside favorable ratings across unified theory of acceptance and use of technology domains, particularly performance expectancy,

effort expectancy, facilitating conditions, and hedonic motivation. Older adults reported positive user experiences, highlighting the accessibility, flexibility, and overall ease of use of the platform, as well as increased confidence in navigating it.

Conclusions: Iterative refinement resulted in targeted usability enhancements. High usability scores, strong adherence rates, and positive user feedback demonstrated the feasibility and acceptability of the PromoSanté digital platform, within a supported implementation context, to deliver tailored, multidisciplinary virtual interventions addressing physical and social deconditioning.

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Keywords: telehealth; digital health; usability testing; older adults; technology acceptance; mixed methods; physical deconditioning; gerontechnology

Introduction

Background

Although life expectancy has increased, aging populations face growing challenges related to chronic conditions, frailty, and functional decline [1]. Physical and social deconditioning are critical but underrecognized processes within this context [2,3]. Physical deconditioning arises from reduced activity, while social deconditioning reflects declining participation and social engagement [4,5]. Their interaction contributes to falls, loss of autonomy, and social withdrawal, reinforcing a self-perpetuating cycle of physical and social restriction [6,7].

Physical activity and social engagement are essential for preventing deconditioning and promoting healthy aging [8,9]. However, participation in face-to-face programs that deliver these activities is often constrained by logistical, mobility-related, and motivational barriers [10,11]. In response to these limitations, remote interventions delivered through digital platforms have emerged as alternative models to promote physical activity and social participation among older adults. These interventions combine synchronous and asynchronous modalities to deliver structured, interactive activities. By improving accessibility and continuity of participation, this hybrid approach facilitates sustained physical and social engagement and has demonstrated feasibility, satisfactory adherence, and positive user perceptions in older populations [12,13].

Despite their promise, digital platforms are not consistently adopted by older adults, and usability challenges are repeatedly cited as major barriers to sustained engagement [14-16]. The ISO defines usability as the extent to which users can achieve specified goals effectively, efficiently, and satisfactorily in a given context [17]. However, many digital health platforms fail to adequately address older adults' needs and levels of digital literacy during the design process [18,19], leading to complex interfaces and navigation difficulties [20,21]. Age-related cognitive and physical changes, such as visual and dexterity impairments, can further reduce telehealth usability and contribute to disengagement or abandonment [22,23].

Prior Work

To address the need for accessible and sustainable solutions promoting long-term physical activity and social participation, a team at the Research Center on Aging in Sherbrooke, Quebec, co-designed PromoSanté [24,25], a multidisciplinary telehealth program. Developed collaboratively with older adults and community and clinical partners, the program aligns content, delivery methods, and technological features with end users' capacities and preferences. Consistent with best-practice approaches to healthy aging and deconditioning prevention, PromoSanté integrates structured exercise, preventive occupational therapy, and well-being support [26,27]. Its multimodal telehealth model combines face-to-face group sessions with synchronous and asynchronous remote delivery to enhance scalability and continuity beyond traditional settings.

A dedicated digital platform underpins this telehealth approach. Built on a learning management system with custom plugins to simplify authentication and enhance usability, the platform features an age-adapted, responsive interface designed to accommodate sensory, cognitive, and motor changes. It supports synchronous videoconferencing and asynchronous engagement through interactive modules and digital resources. Participants used their own devices or, when necessary, an Android tablet provided during the study period.

Objectives of the Study

The present study examined the usability of the digital platform developed to deliver the PromoSanté telehealth program, addressing two complementary objectives. First, it aimed to validate and iteratively refine the usability of the platform prototype. Second, it evaluated the real-world usability of the optimized platform during the implementation of the full PromoSanté telehealth intervention.

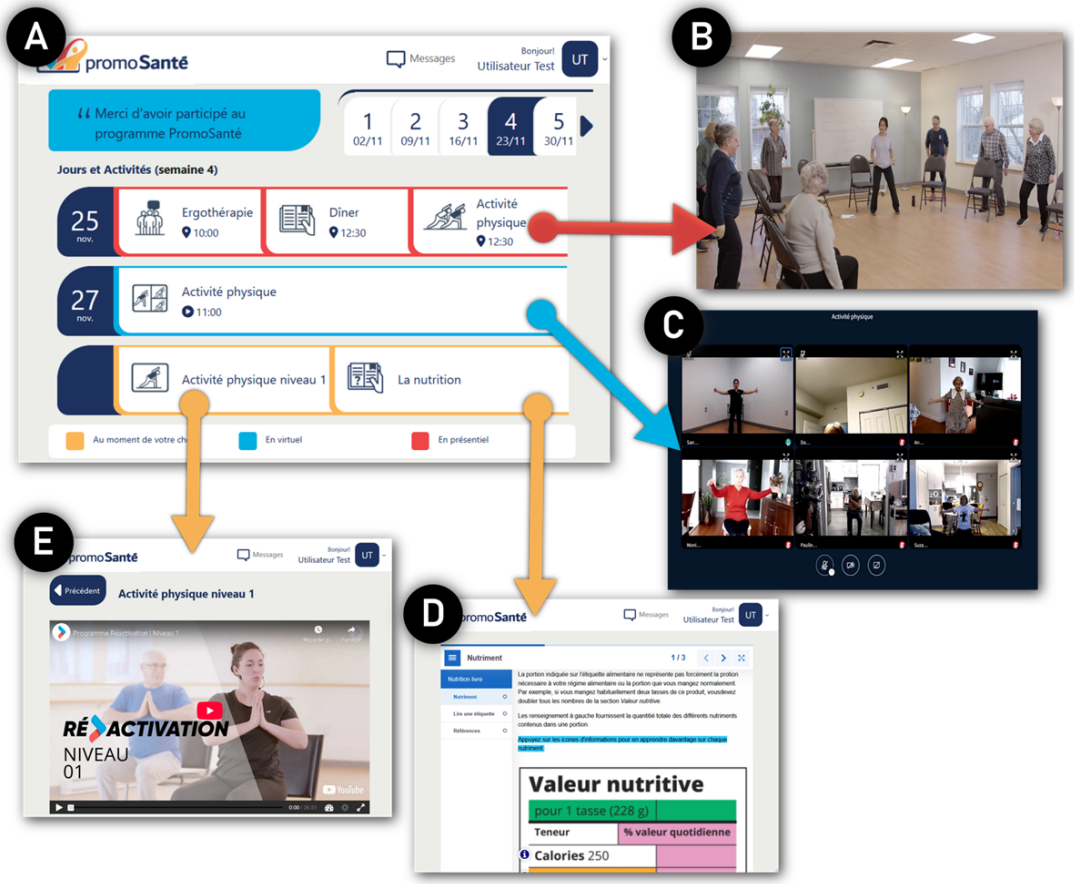
Methods

Design of the Digital Platform

Usability was systematically integrated across the platform's development and evaluation phases to align with end users' needs and capabilities [28]. A preliminary qualitative study elicited older adults' preferences and stakeholder perspectives, informing both program structure and platform design [29]. The interface was then developed through an iterative participatory approach involving researchers in aging and digital health alongside a professional UI designer. Design choices followed systematic review recommendations [30], including simplified layouts, larger and well-spaced interactive elements, and avoidance of edge-based controls.

The design of the digital platform interface is presented in Figure 1. Panel A displays the main dashboard, which functions as the central navigation hub and provides a clear overview of scheduled activities for the selected week. As the default landing page upon login, the dashboard facilitates rapid orientation and awareness of upcoming tasks, consistent with the usability principle of visibility of system status. At the top of the interface, the platform logo and direct access buttons for the user profile are prominently displayed, ensuring consistent and predictable access to core functions, in accordance with the principle of consistency and standards.

Figure 1. Interface of the PromoSanté platform. (A) Main dashboard displaying the program's weekly calendar and serving as the central navigation hub; (B) in-person sessions at the community center; (C) synchronous sessions; (D) asynchronous modules of occupational therapy component; (E) recorded physical exercise sessions.



Scheduled activities are presented in a chronological list, with each entry displaying the corresponding date and time. Each activity is accompanied by a distinct icon representing its type, thereby reducing reliance on text and supporting the principle of recognition rather than recall. To further enhance navigation and comprehension, color coding differentiates delivery modalities: red denotes in-person activities (B), blue indicates synchronous remote sessions (C), and yellow represents asynchronous activities. This visual differentiation facilitates the rapid identification of participation requirements and aligns with the heuristic of match between the system and the real world through intuitive visual cues.

Selecting an activity from the dashboard directs users to the corresponding content or action through a predictable navigation pathway. When a synchronous session is selected, users are automatically redirected to a dedicated interface that provides direct access to the videoconferencing link, thereby minimizing navigation steps and reducing cognitive load in accordance with the principle of efficiency of use. For asynchronous activities, selecting opens a structured content page where all relevant materials are organized in a clear, linear format. This layout allows users to progress at their own pace and to revisit previously completed content, supporting user control and freedom.

Across all modules, the platform maintains consistent navigation pathways, terminology, and visual layouts, enhancing learnability and minimizing the risk of user error. To further reduce cognitive load, the interface limits on-screen options and presents only task-relevant information at each stage, consistent with the heuristic of aesthetic and minimalist design [31].

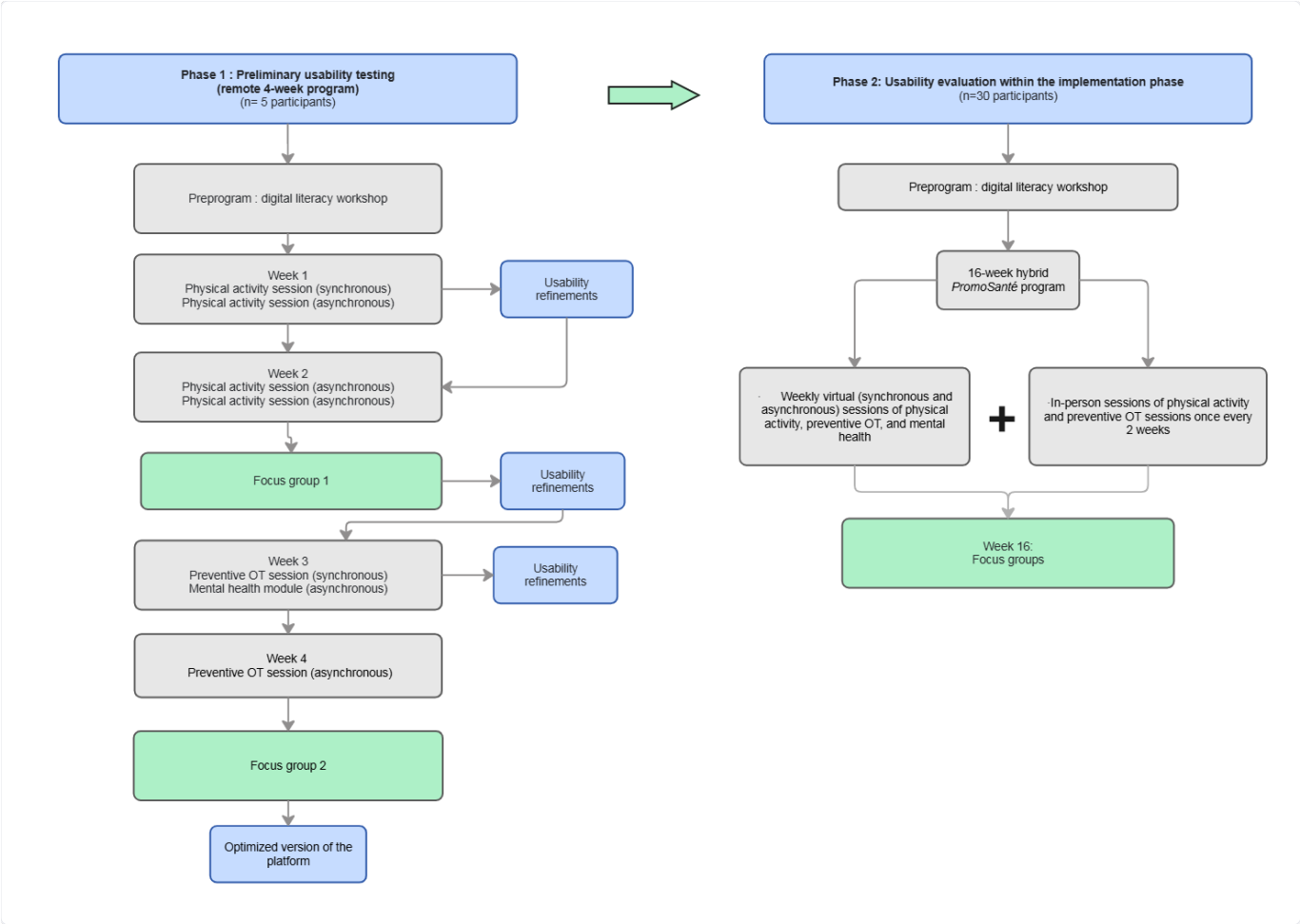
The platform supports several asynchronous activities across the different disciplinary components of the program while preserving these usability principles. The preventive occupational therapy component includes educational capsules and interactive reading materials aimed at promoting functional autonomy and preventive behaviors (D). Within the physical activity components, participants complete prerecorded exercise sessions (E) designed to progressively

increase in intensity over the course of the program, with clear visual cues guiding session selection and progression.

Study Design

The usability evaluation of the PromoSanté digital platform was conducted in 2 sequential phases (Figure 2), each corresponding to a specific study objective. Phase 1 focused on validating and iteratively optimizing the usability of the platform prototype. Preliminary usability testing was conducted using task-based scenarios with a small sample of representative older adults to identify navigation, comprehension, and interaction challenges and to inform targeted design refinements.

Figure 2. Study enrollment. OT: occupational therapy.



Phase 2 examined the real-world usability of the finalized platform during full program implementation. This phase was embedded within a broader evaluation of the 16-week *PromoSanté* program, which combined in-person sessions held in a community center with virtual sessions delivered through the digital platform.

Across both phases, an iterative convergent mixed methods design was employed, involving concurrent collection of quantitative and qualitative data across successive cycles of testing and refinement [32]. Data were analyzed separately within each phase and subsequently triangulated to identify usability strengths, barriers, and improvement priorities. This systematic integration of findings guided platform refinement and ensured alignment with the study's objectives of usability optimization and validation.

Phase 1: Preliminary Usability Testing Phase

Participants' Recruitment

This phase aimed to identify usability barriers to task completion and confirm platform functionality. Participants completed typical virtual PromoSanté activities remotely using the developed platform. Five older adults were purposively recruited from a community center in Sherbrooke, Quebec. Inclusion criteria were age ≥65 years, limitation in at least one activity of daily living, residence in a private dwelling, reliable internet access, basic digital literacy, and French proficiency. Individuals with significant cognitive or sensory impairments that could interfere with study procedures were excluded based on an occupational therapist's assessment. Consistent with usability testing standards, five participants were deemed sufficient to identify most usability issues [33]. Two health care professionals

(a kinesiologist and an occupational therapist) with at least 2 years of experience working with older adults and/or delivering telehealth services led the synchronous sessions.

Testing Procedure

Participants completed a 90-minute digital literacy workshop prior to testing, during which the platform interface and core functions were introduced through interactive demonstrations. Each participant received a study tablet and practiced key tasks (eg, videoconference access and asynchronous module navigation). In addition, the project coordinator conducted individual technical tests with each participant to verify the reliability of their internet connection. Usability testing consisted of a 4-week task-based scenario (Figure 2) simulating typical program use. Activities included synchronous and asynchronous exercise sessions, an occupational therapy session on fall prevention with interactive components, a stress management module, and completion of a home safety checklist.

Data Collection

During phase 1, usability outcomes were collected before, during, and after testing. At baseline, sociodemographic characteristics (age, sex, and education level) and information on participants' digital device use were recorded.

Perceived Usability (Satisfaction)

At the end of the program, perceived usability was assessed using the validated French version of the System Usability Scale (SUS) [34]. The SUS includes 10 items rated on a 5-point Likert scale and produces a total score ranging from 0 to 100 [35]. Scores below 68 indicate below-average usability, scores in the 70s and 80s reflect good usability, and scores above 80.3 indicate excellent usability [36]. The French version demonstrates strong reliability and construct validity comparable to the original English scale [34,36-38].

Task Performance and Interaction (Effectiveness and Efficiency)

Direct observation was conducted during synchronous sessions to document task completion, navigation challenges, and real-time usability issues. A research team member observed each session and provided assistance when necessary. Observational notes were reviewed after each session to identify priority issues and guide iterative refinements. Adherence was measured by tracking attendance at synchronous sessions and the completion of asynchronous activities.

User Experience and Interaction Flow (Effectiveness and Satisfaction)

Two focus groups were conducted in weeks 2 and 4 using a semistructured guide informed by Hierarchical Task Analysis. Hierarchical Task Analysis involves decomposing typical tasks into subtasks and operational steps to examine interaction sequences, identify breakdowns, and explore user perceptions [39,40]. Participants were invited to verbally reconstruct the steps required to complete common platform tasks while viewing the interface. Discussion focused on task completion, navigation pathways, and perceptions of ease of use, clarity, and confidence. Focus groups were audio-recorded and transcribed verbatim.

Data Analysis

SUS scores were analyzed using descriptive statistics (median and semi-IQR).

Qualitative data from the focus groups and observations were analyzed to assess usability from a user-experience perspective, with a particular focus on what participants liked and disliked about the platform, as well as any issues that could hinder their motivation to use it and should therefore be considered and addressed before the subsequent testing phase. In this first phase, 2 members of the research team independently coded the qualitative data to identify segments related to user experience, positive and negative aspects of the platform, and issues that could potentially affect participants' motivation to use it. The coding was then compared and discussed to reach agreement on the identified segments and relevant issues. Quantitative and qualitative findings were analyzed in parallel and subsequently triangulated to identify key usability issues and inform iterative refinements to the platform.

Phase 2: Usability Evaluation Within the Implementation Phase

Participants' Recruitment

Following the resolution of the major usability issues identified in phase 1, a second evaluation was conducted during the full implementation of PromoSanté. This phase assessed platform usability under real-world conditions and examined challenges emerging with sustained use. The 16-week program combined in-person sessions with synchronous and asynchronous remote activities, reflecting routine delivery. Inclusion and exclusion criteria remained unchanged to ensure consistency. A larger sample was recruited, comprising 4 groups of up to 8 older adults each, to evaluate the revised platform. The sample size was determined by available resources, and group composition was informed by recommendations derived from phase 1 (see the *Results* section for details).

A recruitment poster was disseminated through the community center's periodic newsletter. Additionally, pivot workers and occupational therapists at the affiliated hospital center supported recruitment by identifying and approaching eligible patients who were receiving home care services.

Data Collection

Sociodemographic Characteristics and Technology Use

As in phase 1, participants attended a digital literacy workshop to familiarize themselves with the platform prior to program initiation. Baseline demographic characteristics were collected at enrollment. In addition, participants were asked which smart devices they had access to and used to connect

to the internet, how much time they spent online, and whether they received help from others when accessing the internet. These questions were used to characterize participants' level of digital experience and autonomy in using digital technologies.

Attendance at synchronous sessions and completion of asynchronous activities were recorded throughout the intervention to assess adherence.

Technology Acceptance and Usability (the Unified Theory of Acceptance and Use of Technology–Based Questionnaire)

Technology acceptance and determinants of platform use were assessed using an adapted Canadian French version of a unified theory of acceptance and use of technology (UTAUT2)–based questionnaire [41,42]. The instrument included 23 items across 7 domains: performance expectancy (PE), effort expectancy (EE), facilitating conditions (FC), social influence, hedonic motivation (HM), habit, and behavioral intention. Items were rated on a 7-point Likert scale (1="strongly disagree" to 7="strongly agree").

Focus Groups

At the end of the 16-week program, participants were invited to a focus group to explore their experiences with the platform. A semistructured interview guide was developed and explicitly structured around the 3 ISO-defined dimensions of usability: effectiveness, efficiency, and satisfaction [43]. Effectiveness referred to participants' ability to achieve their intended goals using the platform; efficiency captured the time, cognitive, and physical effort required; and satisfaction reflected subjective perceptions, comfort, and overall experience [17]. This framework enabled a systematic examination of real-world usability and complemented the quantitative findings.

Data Analysis

Descriptive analyses were conducted to characterize platform use during the implementation phase, including frequency of platform access and adherence to scheduled synchronous and asynchronous activities as objective indicators of engagement. UTAUT2 data were analyzed descriptively at the domain level. For each participant, mean domain scores were calculated by averaging item responses and rounding to the nearest integer on the 7-point Likert scale. Frequency distributions were generated to determine the proportion of participants at each response level (1-7). For interpretability, scores were categorized as below (<4), equal to (=4), or above (>4) the neutral midpoint, representing disagreement, neutrality, and agreement, respectively. This approach enabled the detailed examination of technology acceptance and usability-related perceptions.

Qualitative data from the focus groups were analyzed thematically using the method proposed by Miles and Huberman [41]. An initial coding strategy was developed based on the 3 usability criteria: effectiveness, efficiency, and satisfaction. Two members of the research team independently coded the data. First, each meaningful segment of the verbatim transcripts was assigned an initial code reflecting its content and meaning. Related codes were then grouped and categorized under one of the 3 predefined usability criteria. The 2 coders subsequently met regularly to compare their coding results, harmonize the identified themes, and resolve discrepancies. When consensus could not be reached, a third member of the research team was consulted to facilitate discussion and reach consensus.

Ethical Considerations

The present study was approved by the Ethics Committee of the CIUSSS de l'Estrie-CHUS (approval number 2022-4277). Written informed consent was obtained from all individuals prior to their participation. The study was conducted in a manner that maintained confidentiality throughout, and all data were deidentified before analysis.

Results

Preliminary Usability Testing Phase

Participants' Characteristics

For this phase of the usability study, 7 participants were recruited: 5 older adults (n=4 women) and 2 health care professionals (both women; n=1 kinesiologist and n=1 occupational therapist) who delivered the interventions via the digital platform. The median age of older participants was 73 (IQR 69-77) years, and 4 had completed postsecondary education. Three lived with a partner and 2 lived alone. All reported at least 2 chronic conditions, most commonly musculoskeletal and respiratory disorders. Two participants had prior telehealth experience (telephone follow-up with a general practitioner or an online session with a kinesiologist). All participants reported regular use of digital technologies, primarily smartphones; 3 used them for more than 3 hours daily, and 4 indicated they required no assistance when using technology.

Adherence and Perceived Usability

All participants completed the asynchronous PromoSanté sessions. Adherence to synchronous sessions was high (90%), with full attendance across the sessions except for one participant, who missed the first 45 minutes because of selecting an incorrect link within the platform. The digital platform PromoSanté demonstrated high overall usability (a median SUS score of 82.5; the median age of older participants was 73, IQR 70-95 years). Ease of use and confidence in using the platform were particularly well rated. Participants also expressed a strong intention to use the platform frequently in the future.

Task Performance and Interaction

Across 2 synchronous physical activity sessions and 1 occupational therapy session, participants were generally able to access the platform and demonstrated high engagement, supporting overall usability effectiveness. However, several usability issues emerged, primarily related to

audiovisual setup, navigation accuracy, and interaction tools. During the first physical activity session, suboptimal camera positioning limited the kinesiologist's ability to observe movements, affecting interaction quality and instructional feedback (efficiency). Introducing tripods and providing clearer preparatory guidance significantly improved participant visibility in subsequent sessions, enhancing both instructional effectiveness and interaction flow. In the second physical activity session, background noise reduced audio clarity and disrupted communication (efficiency). Muting microphones mitigated the issue, and the recommendation to provide wireless headsets to health care professionals aimed to further improve communication quality and reduce cognitive load during facilitation. Participants also demonstrated increasing mastery of platform interaction features (eg, "raise hand"), indicating improved learnability over time. The occupational therapy session highlighted navigation-related usability risks (effectiveness), as one participant misinterpreted calendar information and selected an incorrect session link, requiring telephone assistance. Although content engagement remained high (satisfaction), interaction with shared on-screen tools was uneven, with only 2 participants using them directly. The occupational therapist reported greater cognitive demands compared to in-person delivery, suggesting that virtual facilitation may require adaptation of group size and environmental control to maintain efficiency and reduce facilitator workload.

Qualitative Results: User Perceived Experience and Interaction Flow

Positive Feedback

Overall, participants reported a positive user experience that reflected a user-friendly interface. The interface was described as intuitive and easy to navigate, with clearly displayed information facilitating access to content. Participants found access to synchronous sessions straightforward, noting that clearly labeled links and color-coding effectively distinguished among activity types. Feedback provided within the online physical activity questionnaire—particularly correct answers accompanied by brief explanations—was also appreciated for supporting learning. Synchronous occupational therapy sessions were positively received. Despite limited prior experience with virtual group discussions, participants reported feeling comfortable sharing their perspectives and valued the respectful and engaging atmosphere. Mutual respect was identified as essential to fostering open and dynamic exchanges, reinforcing satisfaction with the virtual group experience.

Issues to Consider

During focus group discussions, some participants reported difficulties with touch-based interactions, particularly typing on virtual keyboards and selecting small interface elements. These challenges, attributed to reduced finger dexterity, occasionally generated frustration and underscored the need for larger interactive targets to improve usability and efficiency. Navigation issues also emerged within asynchronous physical activity modules. Because exercise videos were embedded from the community center's YouTube channel, one participant followed an external link, mistakenly perceiving it as part of the program. Difficulty returning to the PromoSanté platform highlighted the need for clearer navigation cues and stronger visual boundaries when integrating external content.

Final Improvements

As summarized in Table 1, participant feedback from synchronous sessions and focus groups directly informed targeted platform refinements, addressing identified usability barriers and enhancing overall effectiveness, efficiency, and user satisfaction. In addition to technical refinements, a comprehensive user guide was developed to support independent platform use. The guide provides instructions for configuring tablet settings (eg, audio, brightness, and connectivity) and step-by-step directions for accessing the platform, joining synchronous sessions, and navigating asynchronous modules. Key interface sections are visually illustrated and clearly described to reinforce the understanding of their functional roles. This resource was designed to enhance user autonomy, reduce support needs, and promote sustained engagement.

Table 1. Observations, usability issues, and iterative refinements across synchronous sessions of the PromoSanté telehealth platform.

Session	Observations	Usability issues	Iterative refinements
Session 1–synchronous physical activity	Participants successfully joined and followed exercises; partial body visibility on camera; no adverse events	Limited full-body visibility due to difficulties with camera positioning	Tripods provided; in-person setup support; preparatory instructions added (equipment and environment)
Session 2–synchronous physical activity	Positive feedback on asynchronous exercise module; audio clarity issues; use of the "raise hand" feature	Background noise reduced audibility of instructions	Wireless headset will be provided for next sessions to HCPs[a]; participant microphones muted as needed
Session 3–synchronous occupational therapy	High engagement with discussion on home safety; navigation errors when accessing the session; limited use of shared on-screen tools	Confusion when accessing synchronous sessions; difficulty interacting with shared digital activities	Session access button enlarged and repositioned; font size increased to improve visibility and clickability, providing stylus for future users to facilitate touch-based interactions

Session	Observations	Usability issues	Iterative refinements
Across sessions	High engagement with increased cognitive load for facilitators (occupational therapist) in virtual delivery	Managing interaction and attention in larger virtual groups	Recommendation to limit group size (≤8 participants); reminders to join from quiet environments

[a]HCP: health care professional.

Real-World Usability Evaluation (Phase 2)

Participants' Characteristics

Based on available resources, the platform was implemented across 4 groups over 18 months, each comprising up to 8 participants, consistent with recommendations from preliminary usability testing. A total of 30 participants were recruited for this phase. The mean age was 75.1 (SD 5.4) years, and the sample was predominantly female (n=28, 93.3%). Most participants had completed higher education and reported no prior telehealth experience (Table 2).

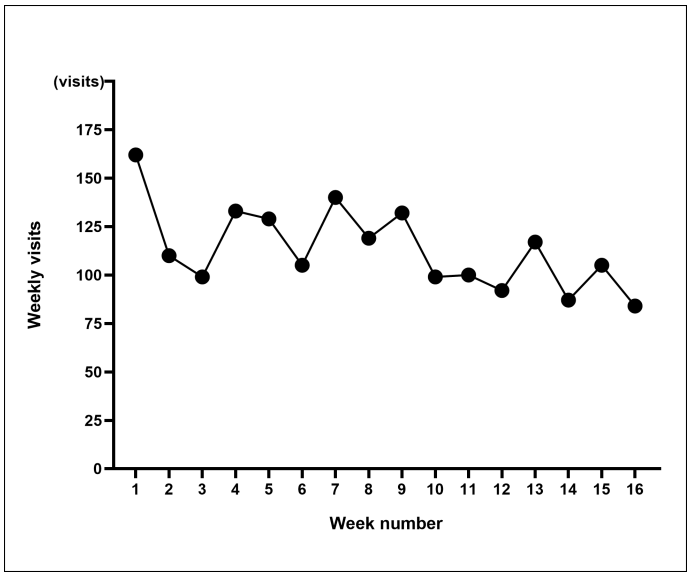
Table 2. Participant characteristics (phase 2; N=30).

Characteristic	Participant, n (%)
Sex	
Female	28 (93.3)
Male	2 (6.7)
Education level	
Secondary	10 (33.3)
College	15 (50)
University	5 (16.7)
Marital status	
Married	15 (50)
Widow	4 (13.3)
Single	2 (6.7)
Divorced	9 (30)
Living situation	
Alone	14 (46.7)
With a partner	14 (46.7)
Other	2 (6.7)
Prior experience with telehealth services	
Yes	7 (23.3)
No	23 (76.7)
Devices used to connect to internet	
Tablet	15 (50)
Laptop	20 (66.7)
Smartphone	17 (56.7)
Daily use of connected devices (h)	
≤1	5 (16.7)
>1 to 3	13 (43.3)
>3 to 5	10 (33.3)
≥5	2 (6.7)
Need assistance to use digital devices	
Yes	10 (33.3)
No	20 (66.7)

Adherence

Over the 16-week program, the PromoSanté platform recorded 1813 visits, averaging 113 (SD 21) visits per week. Figure 3 shows the weekly number of visits per participant. Use peaked during the first week—likely corresponding to initial onboarding and exploration—before stabilizing across subsequent weeks, suggesting the consistent integration of the platform into participants' routines. A slight decline in week 16 may reflect natural tapering at program completion rather than disengagement. Overall, the curve of visits reflected sustained engagement throughout the intervention. Adherence remained high across modalities, with participation rates of 85.4% for synchronous sessions and 83.3% for asynchronous activities, further supporting the platform's acceptability and usability under real-world conditions. One participant was withdrawn from the study based on the occupational therapist's clinical judgment due to increasing confusion and difficulty remembering scheduled sessions.

Figure 3. The number of weekly visits to the platform throughout the 16-week program period.



UTAUT2 Questionnaire

Descriptive statistics for UTAUT2 domains are presented in Figure 4 and Table 3. More than half of the participants rated all domains above the neutral midpoint (>4). The highest proportions of favorable scores were observed for PE, EE, FC, and HM (80%-93.3%), indicating strong perceived usefulness, ease of use, and supportive conditions. In contrast, the habit domain showed comparatively lower endorsement, with 60% scoring above 4% and 23.3% below 4, suggesting that routine integration of the platform was still developing. Overall, the findings reflect positive technology acceptance and favorable perceptions of usability.

Figure 4. Unified theory of acceptance and use of technology (UTAUT2)–based questionnaire scores.

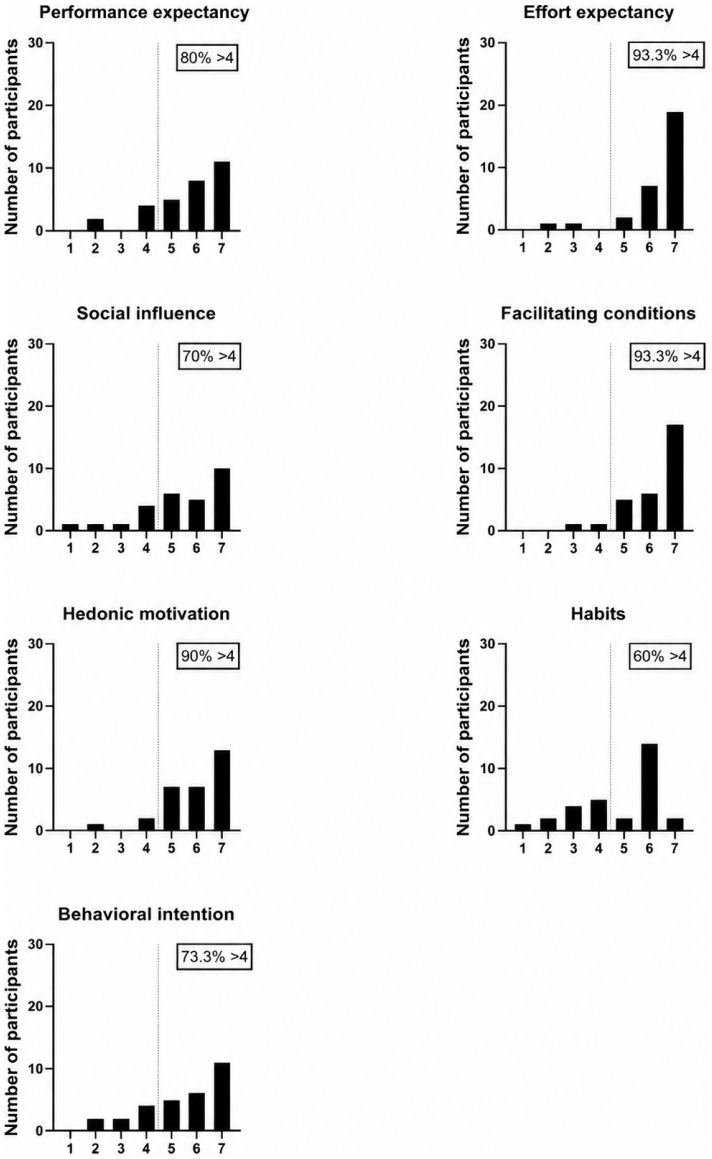


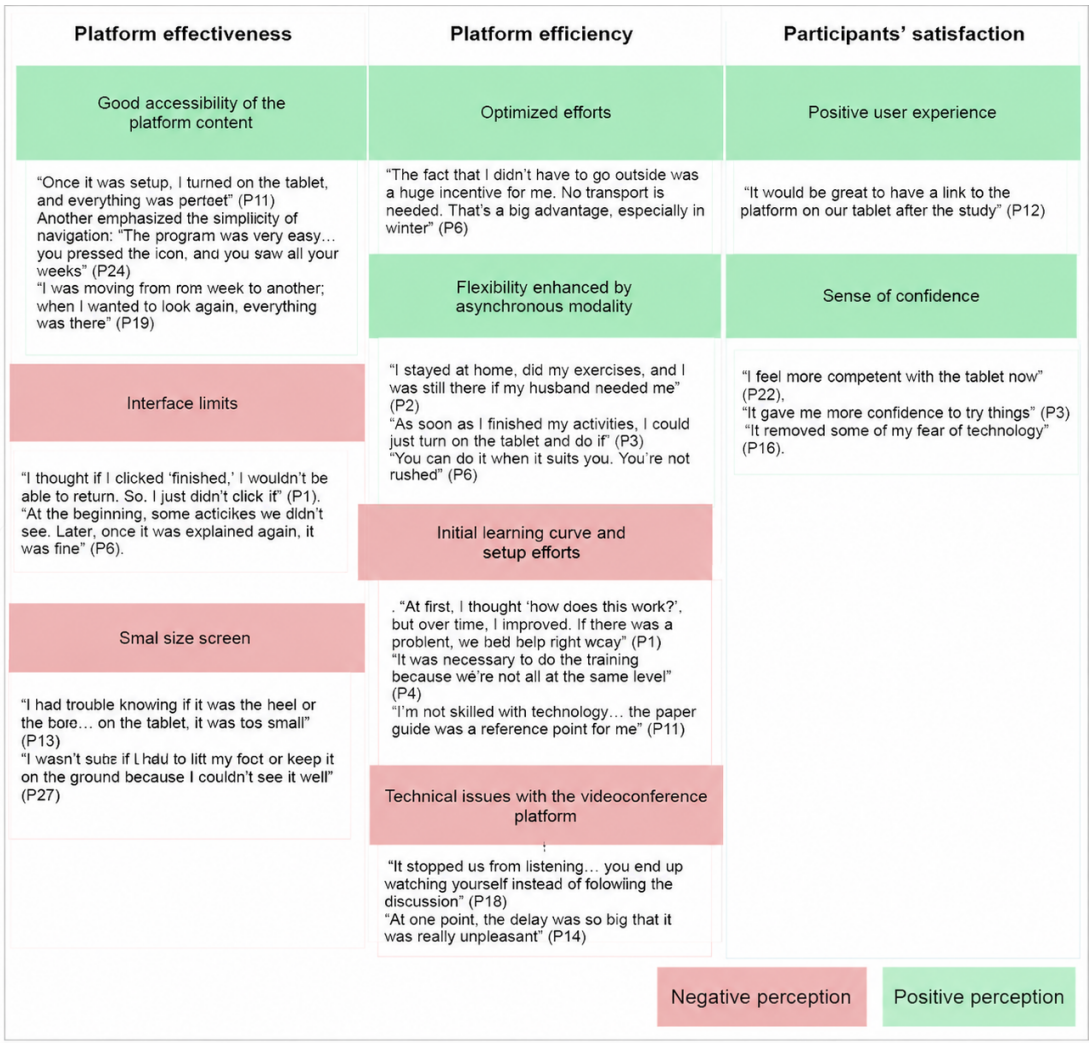
Table 3. Unified theory of acceptance and use of technology (UTAUT2)–based questionnaire ratings.

UTAUT2 score	Performance expectancy	Effort expectancy	Social influence	Facilitating conditions	Hedonic motivation	Habit	Behavioral intention
Median (IQR)	6.2 (5.1-6.7)	7 (5.8-7.0)	6 (4.5-7.0)	7 (5.5-7.0)	6 (5-7)	5.7 (3.7-6.0)	6 (4.4-7.0)
<4 (%)	6.7	6.7	10.0	3.3	3.3	23.3	13.3
=4 (%)	13.3	0.0	13.3	3.4	6.7	16.7	13.4
>4 (%)	80.0	93.3	70.0	93.3	90.0	60.0	73.3

Qualitative Results

Thematic analysis of focus group data generated several subthemes, which were systematically mapped onto the 3 core usability dimensions—effectiveness, efficiency, and satisfaction (Figure 5). This structured organization enabled interpretation of participants' experiences through an established usability framework and facilitated identification of dimension-specific strengths and challenges.

Figure 5. Participants' perceptions of their experience with the digital platform.



Theme 1: Platform Effectiveness

Good Accessibility of the Platform's Content

Participants reported being able to access the platform and complete scheduled activities without significant barriers, indicating strong usability effectiveness under real-world conditions. After the initial onboarding workshop, the interface was perceived as intuitive, suggesting that the platform's structure supported learnability and reduced cognitive load over time. The ability to revisit materials and repeat activities was particularly valued, as it enabled self-paced engagement and reinforced comprehension. This flexibility not only supported user autonomy but also likely contributed to sustained participation by allowing individuals to adapt platform use to their personal routines and functional capacities.

Interface Limitations

Although most participants were able to access the platform content successfully, a few interface elements caused initial confusion. For instance, one participant misunderstood the "mark as completed" function in asynchronous modules, assuming that it would restrict future access to the content, which led to reluctance to use the feature. In addition, during the first week of use, some participants did not immediately recognize that additional content was available through scrolling. These issues highlight minor learnability challenges and underscore the importance of explicit visual cues to support intuitive navigation.

Small Screen Size

A small number of participants reported that the tablet screen size limited their ability to clearly observe certain physical exercises demonstrated by the kinesiologist. Reduced visual clarity, particularly for foot positioning and movement details, affected the precision of interpretation and may have influenced execution accuracy. These findings highlight the importance of optimizing visual presentation and screen visibility when delivering movement-based content remotely.

Theme 2: Platform Efficiency

Optimized Efforts

Participants identified several benefits associated with the PromoSanté platform, particularly its capacity to reduce logistical and time-related constraints. Virtual delivery minimized transportation demands and mobility-related barriers, thereby enhancing accessibility for individuals with

physical limitations. This reduction in practical burdens was perceived as facilitating consistent attendance and supporting adherence to program sessions.

Flexibility Enhanced by Asynchronous Modality

Asynchronous sessions were perceived as an efficient and adaptable modality, enabling participants to integrate program activities into their daily routines. The absence of fixed schedules allowed activities to be completed at times that aligned with individual availability and responsibilities. This flexibility was particularly salient for one participant who served as a caregiver, as it enabled continued engagement in the program while fulfilling caregiving duties. These findings underscore the role of asynchronous delivery in supporting accessibility, autonomy, and sustained participation.

Initial Learning Curve and Setup Efforts

Despite the benefits of virtual delivery, initial engagement with the PromoSanté platform was challenging for some participants, particularly those with limited digital literacy. Over time, however, participants reported increased familiarity and growing confidence in using the platform's features, reflecting improved learnability. Early technical support from the research team was identified as instrumental in facilitating this transition. Participants also emphasized the importance of the initial training session and printed user guide in supporting participants' understanding of the platform's structure and core functionalities. These resources were especially valuable during the onboarding phase and contributed to more efficient and confident interactions as use progressed.

Technical Issues With the Videoconference Platform BigBlueButton

Participants reported technical difficulties during some synchronous occupational therapy sessions, particularly audio and video delays. These disruptions affected conversational flow, limited interaction, and caused overlaps and misunderstandings. Several participants expressed frustration, indicating that unresolved connectivity issues could compromise communication quality and negatively impact overall usability.

Theme 3: Participants' Satisfaction With the Use of the Platform

Positive User Experience

Overall, participants reported high satisfaction with the platform and described the experience as enjoyable. Despite identified challenges, both the content and delivery modalities were perceived as acceptable and engaging throughout the program. Importantly, several participants expressed willingness to continue accessing and using the platform beyond the study period and to recommend it to others, indicating strong acceptability and positive behavioral intention.

Sense of Confidence

Several participants reported that their positive experience extended beyond usability to increased self-confidence in engaging with digital technologies and participating in similar programs. Successfully completing the sessions reinforced their perceived competence and strengthened confidence in their ability to adopt and sustain technology-based health interventions.

Discussion

Principal Findings

This study aimed to iteratively evaluate and refine the usability of the PromoSanté digital platform under both controlled and real-world conditions. Consistent with these objectives, the findings demonstrate that the platform achieved high usability and functional integrity across phases, while iterative refinements addressed barriers identified during preliminary testing. High adherence rates during full implementation indicate a successful integration of the platform into routine program delivery, and qualitative findings highlight strong user satisfaction alongside minor usability challenges that require optimization.

The first phase demonstrated high perceived usability, with a SUS score of 83 out of 100. This rating exceeds most usability scores reported in a scoping review of digital technologies for older adults, in which values were generally above average but commonly below 80 [44]. Despite this strong overall performance, participants identified challenges with touch-based interactions, particularly related to small interface elements. These findings informed targeted refinements, including enlarging touch targets and optimizing button placement to enhance accessibility and reduce interaction difficulty. Such adjustments are consistent with prior research, emphasizing the importance of larger interactive elements to improve touchscreen usability among older adults [45,46]. Importantly, these usability issues did not impede task completion and were not perceived as major barriers to platform use. Instead, the refinements highlighted the critical role of appropriate supporting equipment—such as tripods for participants and microphones for health care professionals—in optimizing interaction quality during synchronous sessions. This observation aligns with prior findings by Aoun et al [47], who underscored that video-based telehealth modalities require careful technical preparation and ongoing support to ensure an effective and satisfactory user experience. Participants emphasized the importance of providing a user guide—particularly in printed format—to support future users and enhance platform usability. When combined with initial training, these resources were perceived as especially valuable for individuals with limited digital experience, facilitating onboarding and reducing early uncertainty. This finding aligns with prior research demonstrating that structured guidance and instructional materials promote adoption and effective use of new technologies in real-world contexts [48,49].

High adherence rates for both synchronous (85.4%) and asynchronous (83.3%) sessions further support the platform's effectiveness in delivering accessible virtual content. Similar adherence levels have been reported in studies by Granet et al [50,51] evaluating online physical exercise programs using combined modalities. However, in those studies, asynchronous content was delivered through a web platform, whereas synchronous sessions required access via external email links. In contrast, PromoSanté integrates both modalities within a single interface. This unified design likely enhances usability by reducing navigation complexity and supporting seamless participation across program components.

The results from UTAUT2 showed higher ratings on PE, EE, FC, and HM. From a usability standpoint, these domains suggest that the platform was perceived as useful, easy to use, enjoyable, and adequately supported. Consistent with this interpretation, prior studies applying the UTAUT2 framework in older adult populations have identified PE, EE, HM, and FC as key predictors of behavioral intention to adopt digital technologies [52-54].

Qualitative findings further substantiated these results, reflecting positive perceptions of usability across the dimensions of effectiveness, efficiency, and satisfaction. Continuous access to platform content was particularly valued, consistent with evidence that uninterrupted digital access enhances autonomy and accessibility among older adults [55]. The asynchronous modality emerged as a central facilitator, reducing time-related constraints and accommodating individual routines. This flexibility is especially relevant in aging populations marked by heterogeneous schedules and fluctuating energy levels [56]. Collectively, these findings suggest that, when thoughtfully designed, digital interventions can align well with older adults' daily contexts, challenging assumptions that this population is inherently resistant to technology-based solutions. Qualitative findings further reinforced these results, highlighting participants' positive perceptions of platform usability across the dimensions of effectiveness, efficiency, and satisfaction. Continuous access to platform content was particularly valued, aligning with prior research demonstrating that uninterrupted access to digital resources enhances accessibility and supports autonomous engagement among older adults [55]. In addition, the asynchronous modality was identified as a key benefit, as it reduced time-related constraints and accommodated individual routines. This flexibility is especially pertinent in aging populations characterized by heterogeneous daily schedules and varying levels of energy and availability [56]. This suggests that older adults' living contexts may be more supportive of digital interventions than commonly assumed.

Limitations

Despite promising findings, several limitations should be acknowledged. First, most participants reported regular use of digital devices, suggesting relatively high levels of digital literacy. Additionally, findings must be interpreted within the study's implementation context, where digital literacy workshops, technical support, and tablets were provided, and most participants had access to reliable internet connectivity. These resources may have contributed to participants' ability to engage with the platform and should therefore be considered FC for its use. Thus, the positive usability experiences observed in this study may not fully reflect platform use in settings where such support and resources are not readily available, particularly among older adults with lower digital literacy.

In routine practice, inconsistent access to such resources may affect scalability and long-term sustainability. Organizations implementing such a platform should therefore carefully consider and evaluate the resources required to support adoption and sustained use at scale. Second, resource constraints limited implementation to 30 participants, which may not fully represent the social, physical, and cognitive heterogeneity of the broader aging population. Broader deployments across more diverse demographic and geographic contexts are therefore warranted. Although engagement remained high, a slight decline in platform visits was observed over the 16-week period. Longer-term studies are needed to evaluate sustained use, as telehealth engagement may decrease over extended follow-up. Finally, because tablets were provided, future research should assess usability on participants' personal devices to better reflect real-world conditions.

Future Perspectives

Findings from this study indicate that the digital platform supporting virtual delivery of the PromoSanté program is both usable and well accepted by older adults. Building on these results, a research and innovation grant has been secured to further optimize the platform in preparation for large-scale deployment. The next phase will enhance technological maturity through 2 stages. First, the current proof of concept will be transformed into a more secure, modular, and scalable platform capable of supporting multiple programs across diverse user groups, with advanced user engagement functionalities integrated and iteratively validated with end users. Second, the finalized prototype will undergo comprehensive usability testing under real-world conditions to confirm performance, robustness, and scalability.

Conclusion

This study evaluated and refined the usability of a co-designed digital platform supporting the PromoSanté program through an iterative testing process. Initial findings showed high user satisfaction and underscored the importance of a clear, accessible interface and adapted equipment for touch-based interaction. Real-world implementation confirmed the platform's ability to enhance accessibility and flexibility through integrated synchronous and asynchronous delivery, while highlighting the importance of appropriate support and implementation conditions to enable sustained use among older adults. Future large-scale implementation and continued technological optimization will be critical to confirming long-term engagement, scalability, and integration within routine service delivery.

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Generative AI Use

Generative AI tool (ChatGPT [OpenAI]) was used occasionally for linguistic assistance (activity 1, column 1, according to the AI Activities Table included in the journal guidelines).

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Data Availability

The datasets generated or analyzed during this study are available from the corresponding author upon reasonable request.

Authors' Contributions

Conceptualization: NK, PB, ML, MA-L, CV, PR, RN
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Formal analysis: NK, PB, CC, SB
Funding acquisition: PB, ML
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Conflicts of Interest

None declared.

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Abbreviations

EE: effort expectancy
FC: facilitating conditions
HM: hedonic motivation
PE: performance expectancy
SUS: System Usability Scale
UTAUT2: unified theory of acceptance and use of technology

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